

10/561315

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<110> Zhou, Xiangjun
Dong, John Y.

<120> VACCINE AGAINST SARS

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<140> CN03142873.8

<141> 2003-06-17

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<170> PatentIn version 3.2

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<211> 347

<212> DNA

<213> SARS coronaviruses (SARS-CoV)

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aagtgagtac gaacttatgt actcattcgt ttcggaagaa acaggtagct taatagttaa	300
tagcgtactt ctttttcttg ctttcgtggt attcttgcta gtcacactag ccatacctac	360
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 <212> PRT
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 coronaviruses (SARS-CoV)

<400> 8

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 20 25 30

Asp Ser Val Glu Glu Ala Leu Ser Glu Ala Arg Glu His Leu Lys Asn
 35 40 45

Gly Thr Cys Gly Leu Val Glu Leu Glu Lys Gly Val Leu Pro Gln Leu
 50 55 60

Glu Gln Pro Tyr Val Phe Ile Lys Arg Ser Asp Ala Leu Ser Thr Asn
 65 70 75 80

His Cys His Lys Val Val Glu Leu Val Ala Glu Met Asp Gly Ile Gln
 85 90 95

Tyr Gly Arg Ser Gly Ile Thr Leu Gly Val Leu Val Pro His Val Gly
 100 105 110

Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn
 115 120 125

Lys Gly Ala Gly Gly His Ser Tyr Gly Ile Asp Leu Lys Ser Tyr Asp
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Leu Gly Asp Glu Leu Gly Thr Asp Pro Ile Glu Asp Tyr Glu Gln Asn
 145 150 155 160

Trp Asn Thr Lys His Gly Ser Gly Ala Leu Arg Glu Leu Thr Arg Glu
 165 170 175

Leu Asn Gly Gly Ala Val Thr Arg Tyr Val Asp Asn Asn Phe Cys Gly
 180 185 190

Pro Asp Gly Tyr Pro Leu Asp Cys Ile Lys Asp Phe Leu Ala Arg Ala
 195 200 205

Gly Lys Ser Met Cys Thr Leu Ser Glu Gln Leu Asp Tyr Ile Glu Ser
 210 215 220

Lys Arg Gly Val Tyr Cys Cys Arg Asp His Glu His Glu Ile Ala Trp
 225 230 235 240

Phe Thr Glu Arg Ser Asp Lys Ser Tyr Glu His Gln Thr Pro Phe Glu
 245 250 255

Ile Lys Ser Ala Lys Lys Phe Asp Thr Phe Lys Gly Glu Cys Pro Lys
 260 265 270

Phe Val Phe Pro Leu Asn Ser Lys Val Lys Val Ile Gln Pro Arg Val
 275 280 285

Glu Lys Lys Lys Thr Glu Gly Phe Met Gly Arg Ile Arg Ser Val Tyr
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Pro Val Ala Ser Pro Gln Glu Cys Asn Asn Met His Leu Ser Thr Leu
 305 310 315 320

Met Lys Cys Asn His Cys Asp Glu Val Ser Trp Gln Thr Cys Asp Phe
 325 330 335

Leu Lys Ala Thr Cys Glu His Cys Gly Thr Glu Asn Leu Val Ile Glu
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Gly Pro Thr Thr Cys Gly Tyr Leu Pro Thr Asn Ala Val Val Lys Met
 355 360 365

Pro Cys Pro Ala Cys Gln Asp Pro Glu Ile Gly Pro Glu His Ser Val
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Ala Asp Tyr His Asn His Ser Asn Ile Glu Thr Arg Leu Arg Lys Gly
 385 390 395 400

Gly Arg Thr Arg Cys Phe Gly Gly Cys Val Phe Ala Tyr Val Gly Cys
 405 410 415

Tyr Asn Lys Arg Ala Tyr Trp Val Pro Arg Ala Ser Ala Asp Ile Gly
 420 425 430

Ser Gly His Thr Gly Ile Thr Gly Asp Asn Val Glu Thr Leu Asn Glu
 435 440 445

Asp Leu Leu Glu Ile Leu Ser Arg Glu Arg Val Asn Ile Asn Ile Val
 450 455 460

Gly Asp Phe His Leu Asn Glu Glu Val Ala Ile Ile Leu Ala Ser Phe
 465 470 475 480

Ser Ala Ser Thr Ser Ala Phe Ile Asp Thr Ile Lys Ser Leu Asp Tyr

485										490					495				
Lys	Ser	Phe	Lys	Thr	Ile	Val	Glu	Ser	Cys	Gly	Asn	Tyr	Lys	Val	Thr				
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Lys	Gly	Lys	Pro	Val	Lys	Gly	Ala	Trp	Asn	Ile	Gly	Gln	Gln	Arg	Ser				
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Ser	Leu	Arg	Leu	Val	Asp	Ala	Met	Val	Tyr	Thr	Ser	Asp	Leu	Leu	Thr				
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Thr	Ser	Gln	Trp	Leu	Ser	Asn	Leu	Leu	Gly	Thr	Thr	Val	Glu	Lys	Leu				
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Arg	Pro	Ile	Phe	Glu	Trp	Ile	Glu	Ala	Lys	Leu	Ser	Ala	Gly	Val	Glu				
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Phe	Leu	Lys	Asp	Ala	Trp	Glu	Ile	Leu	Lys	Phe	Leu	Ile	Thr	Gly	Val				
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Asp	Cys	Val	Lys	Cys	Phe	Ile	Asp	Val	Val	Asn	Lys	Ala	Leu	Glu	Met				
		675					680					685							
Cys	Ile	Asp	Gln	Val	Thr	Ile	Ala	Gly	Ala	Lys	Leu	Arg	Ser	Leu	Asn				
	690					695					700								
Leu	Gly	Glu	Val	Phe	Ile	Ala	Gln	Ser	Lys	Gly	Leu	Tyr	Arg	Gln	Cys				
705					710					715					720				

Ile Arg Gly Lys Glu Gln Leu Gln Leu Leu Met Pro Leu Lys Ala Pro
 725 730 735

Lys Glu Val Thr Phe Leu Glu Gly Asp Ser His Asp Thr Val Leu Thr
 740 745 750

Ser Glu Glu Val Val Leu Lys Asn Gly Glu Leu Glu Ala Leu Glu Thr
 755 760 765

Pro Val Asp Ser Phe Thr Asn Gly Ala Ile Val Gly Thr Pro Val Cys
 770 775 780

Val Asn Gly Leu Met Leu Leu Glu Ile Lys Asp Lys Glu Gln Tyr Cys
 785 790 795 800

Ala Leu Ser Pro Gly Leu Leu Ala Thr Asn Asn Val Phe Arg Leu Lys
 805 810 815

Gly Gly Ala Pro Ile Lys Gly Val Thr Phe Gly Glu Asp Thr Val Trp
 820 825 830

Glu Val Gln Gly Tyr Lys Asn Val Arg Ile Thr Phe Glu Leu Asp Glu
 835 840 845

Arg Val Asp Lys Val Leu Asn Glu Lys Cys Ser Val Tyr Thr Val Glu
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Ser Gly Thr Glu Val Thr Glu Phe Ala Cys Val Val Ala Glu Ala Val
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Val Lys Thr Leu Gln Pro Val Ser Asp Leu Leu Thr Asn Met Gly Ile
 885 890 895

Asp Leu Asp Glu Trp Ser Val Ala Thr Phe Tyr Leu Phe Asp Asp Ala
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Gly Glu Glu Asn Phe Ser Ser Arg Met Tyr Cys Ser Phe Tyr Pro Pro
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Asp Glu Glu Glu Glu Asp Asp Ala Glu Cys Glu Glu Glu Ile Asp
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Glu Thr Cys Glu His Glu Tyr Gly Thr Glu Asp Asp Tyr Gln Gly Leu
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Pro Leu Glu Phe Gly Ala Ser Ala Glu Thr Val Arg Val Glu Glu Glu
965 970 975

Glu Glu Glu Asp Trp Leu Asp Asp Thr Thr Glu Gln Ser Glu Ile Glu
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Pro Glu Pro Glu Pro Thr Pro Glu Glu Pro Val Asn Gln Phe Thr Gly
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Tyr Leu Lys Leu Thr Asp Asn Val Ala Ile Lys Cys Ala Asp Ile
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Val Lys Glu Ala Gln Ser Ala Asn Pro Met Val Ile Val Asn Ala
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Ala Asn Ile His Leu Lys His Gly Gly Gly Val Ala Gly Ala Leu
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Asn Lys Ala Thr Asn Gly Ala Met Gln Lys Glu Ser Asp Asp Tyr
1055 1060 1065

Ile Lys Leu Asn Gly Pro Leu Thr Val Gly Gly Ser Cys Leu Leu
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Ser Gly His Asn Leu Ala Lys Lys Cys Leu His Val Val Gly Pro
1085 1090 1095

Asn Leu Asn Ala Gly Glu Asp Ile Gln Leu Leu Lys Ala Ala Tyr
1100 1105 1110

Glu Asn Phe Asn Ser Gln Asp Thr Leu Leu Ala Pro Leu Leu Ser
1115 1120 1125

Ala Gly Ile Phe Gly Ala Lys Pro Leu Gln Ser Leu Gln Val Cys
1130 1135 1140

Val Gln Thr Val Arg Thr Gln Val Tyr Ile Ala Val Asn Asp Lys
1145 1150 1155

Ala Leu Tyr Glu Gln Val Val Met Asp Tyr Leu Asp Asn Leu Lys
1160 1165 1170

Pro Arg Val Glu Ala Pro Lys Gln Glu Glu Pro Pro Asn Thr Glu
1175 1180 1185

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Val	Lys	Pro	Lys	Ile	Lys	Ala	Cys	Ile	Asp	Glu	Val	Thr	Thr	Thr
1205						1210					1215			
Leu	Glu	Glu	Thr	Lys	Phe	Leu	Thr	Asn	Lys	Leu	Leu	Leu	Phe	Ala
1220						1225					1230			
Asp	Ile	Asn	Gly	Lys	Leu	Tyr	His	Asp	Ser	Gln	Asn	Met	Leu	Arg
1235						1240					1245			
Gly	Glu	Asp	Met	Ser	Phe	Leu	Glu	Lys	Asp	Ala	Pro	Tyr	Met	Val
1250						1255					1260			
Gly	Asp	Val	Ile	Thr	Ser	Gly	Asp	Ile	Thr	Cys	Val	Val	Ile	Pro
1265						1270					1275			
Ser	Lys	Lys	Ala	Gly	Gly	Thr	Thr	Glu	Met	Leu	Ser	Arg	Ala	Leu
1280						1285					1290			
Lys	Lys	Val	Pro	Val	Asp	Glu	Tyr	Ile	Thr	Thr	Tyr	Pro	Gly	Gln
1295						1300					1305			
Gly	Cys	Ala	Gly	Tyr	Thr	Leu	Glu	Glu	Ala	Arg	Thr	Ala	Leu	Lys
1310						1315					1320			
Lys	Cys	Lys	Ser	Ala	Phe	Tyr	Val	Leu	Pro	Ser	Glu	Ala	Pro	Asn
1325						1330					1335			
Ala	Lys	Glu	Glu	Ile	Leu	Gly	Thr	Val	Ser	Trp	Asn	Leu	Arg	Glu
1340						1345					1350			
Met	Leu	Ala	His	Ala	Glu	Glu	Thr	Arg	Lys	Leu	Met	Pro	Ile	Cys
1355						1360					1365			
Met	Asp	Val	Arg	Ala	Ile	Met	Ala	Thr	Ile	Gln	Arg	Lys	Tyr	Lys
1370						1375					1380			
Gly	Ile	Lys	Ile	Gln	Glu	Gly	Ile	Val	Asp	Tyr	Gly	Val	Arg	Phe
1385						1390					1395			
Phe	Phe	Tyr	Thr	Ser	Lys	Glu	Pro	Val	Ala	Ser	Ile	Ile	Thr	Lys

1400		1405		1410
Leu Asn Ser Leu Asn Glu Pro	Leu Val Thr Met Pro	Ile Gly Tyr		
1415	1420	1425		
Val Thr His Gly Phe Asn Leu	Glu Glu Ala Ala Arg	Cys Met Arg		
1430	1435	1440		
Ser Leu Lys Ala Pro Ala Val	Val Ser Val Ser Ser	Pro Asp Ala		
1445	1450	1455		
Val Thr Thr Tyr Asn Gly Tyr	Leu Thr Ser Ser Ser	Lys Thr Ser		
1460	1465	1470		
Glu Glu His Phe Val Glu Thr	Val Ser Leu Ala Gly	Ser Tyr Arg		
1475	1480	1485		
Asp Trp Ser Tyr Ser Gly Gln	Arg Thr Glu Leu Gly	Val Glu Phe		
1490	1495	1500		
Leu Lys Arg Gly Asp Lys Ile	Val Tyr His Thr Leu	Glu Ser Pro		
1505	1510	1515		
Val Glu Phe His Leu Asp Gly	Glu Val Leu Ser Leu	Asp Lys Leu		
1520	1525	1530		
Lys Ser Leu Leu Ser Leu Arg	Glu Val Lys Thr Ile	Lys Val Phe		
1535	1540	1545		
Thr Thr Val Asp Asn Thr Asn	Leu His Thr Gln Leu	Val Asp Met		
1550	1555	1560		
Ser Met Thr Tyr Gly Gln Gln	Phe Gly Pro Thr Tyr	Leu Asp Gly		
1565	1570	1575		
Ala Asp Val Thr Lys Ile Lys	Pro His Val Asn His	Glu Gly Lys		
1580	1585	1590		
Thr Phe Phe Val Leu Pro Ser	Asp Asp Thr Leu Arg	Ser Glu Ala		
1595	1600	1605		
Phe Glu Tyr Tyr His Thr Leu	Asp Glu Ser Phe Leu	Gly Arg Tyr		
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Met	Ser	Ala	Leu	Asn	His	Thr	Lys	Lys	Trp	Lys	Phe	Pro	Gln	Val
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Gly	Gly	Leu	Thr	Ser	Ile	Lys	Trp	Ala	Asp	Asn	Asn	Cys	Tyr	Leu
1640						1645					1650			
Ser	Ser	Val	Leu	Leu	Ala	Leu	Gln	Gln	Ile	Glu	Val	Lys	Phe	Asn
1655						1660					1665			
Ala	Pro	Ala	Leu	Gln	Glu	Ala	Tyr	Tyr	Arg	Ala	Arg	Ala	Gly	Asp
1670						1675					1680			
Ala	Ala	Asn	Phe	Cys	Ala	Leu	Ile	Leu	Ala	Tyr	Ser	Asn	Lys	Thr
1685						1690					1695			
Val	Gly	Glu	Leu	Gly	Asp	Val	Arg	Glu	Thr	Met	Thr	His	Leu	Leu
1700						1705					1710			
Gln	His	Ala	Asn	Leu	Glu	Ser	Ala	Lys	Arg	Val	Leu	Asn	Val	Val
1715						1720					1725			
Cys	Lys	His	Cys	Gly	Gln	Lys	Thr	Thr	Thr	Leu	Thr	Gly	Val	Glu
1730						1735					1740			
Ala	Val	Met	Tyr	Met	Gly	Thr	Leu	Ser	Tyr	Asp	Asn	Leu	Lys	Thr
1745						1750					1755			
Gly	Val	Ser	Ile	Pro	Cys	Val	Cys	Gly	Arg	Asp	Ala	Thr	Gln	Tyr
1760						1765					1770			
Leu	Val	Gln	Gln	Glu	Ser	Ser	Phe	Val	Met	Met	Ser	Ala	Pro	Pro
1775						1780					1785			
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1790						1795					1800			
Tyr	Thr	Gly	Asn	Tyr	Gln	Cys	Gly	His	Tyr	Thr	His	Ile	Thr	Ala
1805						1810					1815			
Lys	Glu	Thr	Leu	Tyr	Arg	Ile	Asp	Gly	Ala	His	Leu	Thr	Lys	Met
1820						1825					1830			
Ser	Glu	Tyr	Lys	Gly	Pro	Val	Thr	Asp	Val	Phe	Tyr	Lys	Glu	Thr
1835						1840					1845			

Ser	Tyr	Thr	Thr	Thr	Ile	Lys	Pro	Val	Ser	Tyr	Lys	Leu	Asp	Gly
1850						1855					1860			
Val	Thr	Tyr	Thr	Glu	Ile	Glu	Pro	Lys	Leu	Asp	Gly	Tyr	Tyr	Lys
1865						1870					1875			
Lys	Asp	Asn	Ala	Tyr	Tyr	Thr	Glu	Gln	Pro	Ile	Asp	Leu	Val	Pro
1880						1885					1890			
Thr	Gln	Pro	Leu	Pro	Asn	Ala	Ser	Phe	Asp	Asn	Phe	Lys	Leu	Thr
1895						1900					1905			
Cys	Ser	Asn	Thr	Lys	Phe	Ala	Asp	Asp	Leu	Asn	Gln	Met	Thr	Gly
1910						1915					1920			
Phe	Thr	Lys	Pro	Ala	Ser	Arg	Glu	Leu	Ser	Val	Thr	Phe	Phe	Pro
1925						1930					1935			
Asp	Leu	Asn	Gly	Asp	Val	Val	Ala	Ile	Asp	Tyr	Arg	His	Tyr	Ser
1940						1945					1950			
Ala	Ser	Phe	Lys	Lys	Gly	Ala	Lys	Leu	Leu	His	Lys	Pro	Ile	Val
1955						1960					1965			
Trp	His	Ile	Asn	Gln	Ala	Thr	Thr	Lys	Thr	Thr	Phe	Lys	Pro	Asn
1970						1975					1980			
Thr	Trp	Cys	Leu	Arg	Cys	Leu	Trp	Ser	Thr	Lys	Pro	Val	Asp	Thr
1985						1990					1995			
Ser	Asn	Ser	Phe	Glu	Val	Leu	Ala	Val	Glu	Asp	Thr	Gln	Gly	Met
2000						2005					2010			
Asp	Asn	Leu	Ala	Cys	Glu	Ser	Gln	Gln	Pro	Thr	Ser	Glu	Glu	Val
2015						2020					2025			
Val	Glu	Asn	Pro	Thr	Ile	Gln	Lys	Glu	Val	Ile	Glu	Cys	Asp	Val
2030						2035					2040			
Lys	Thr	Thr	Glu	Val	Val	Gly	Asn	Val	Ile	Leu	Lys	Pro	Ser	Asp
2045						2050					2055			
Glu	Gly	Val	Lys	Val	Thr	Gln	Glu	Leu	Gly	His	Glu	Asp	Leu	Met
2060						2065					2070			

Ala Ala Tyr Val Glu Asn Thr Ser Ile Thr Ile Lys Lys Pro Asn
 2075 2080 2085

Glu Leu Ser Leu Ala Leu Gly Leu Lys Thr Ile Ala Thr His Gly
 2090 2095 2100

Ile Ala Ala Ile Asn Ser Val Pro Trp Ser Lys Ile Phe Ala Tyr
 2105 2110 2115

Val Lys Pro Phe Leu Gly Gln Ala Ala Ile Thr Thr Ser Asn Cys
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Ala Lys Arg Leu Ala Gln Arg Val Phe Asn Asn Tyr Met Pro Tyr
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Val Phe Thr Leu Leu Phe Gln Leu Cys Thr Phe Thr Lys Ser Thr
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Asn Ser Arg Ile Arg Ala Ser Leu Pro Thr Thr Ile Ala Lys Asn
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Ser Val Lys Ser Val Ala Lys Leu Cys Leu Asp Ala Gly Ile Asn
 2180 2185 2190

Tyr Val Lys Ser Pro Lys Phe Ser Lys Leu Phe Thr Ile Ala Met
 2195 2200 2205

Trp Leu Leu Leu Leu Ser Ile Cys Leu Gly Ser Leu Ile Tyr Val
 2210 2215 2220

Thr Ala Ala Phe Gly Val Leu Leu Ser Asn Phe Gly Ala Pro Ser
 2225 2230 2235

Tyr Cys Asn Gly Val Arg Glu Leu Tyr Leu Asn Ser Ser Asn Val
 2240 2245 2250

Thr Thr Met Asp Phe Cys Glu Gly Ser Phe Pro Cys Ser Ile Cys
 2255 2260 2265

Leu Ser Gly Leu Asp Ser Leu Asp Ser Tyr Pro Ala Leu Glu Thr
 2270 2275 2280

Ile Gln Val Thr Ile Ser Ser Tyr Lys Leu Asp Leu Thr Ile Leu

2285		2290		2295
Gly Leu Ala Ala Glu Trp Val	Leu Ala Tyr Met	Leu Phe Thr Lys		
2300	2305	2310		
Phe Phe Tyr Leu Leu Gly Leu	Ser Ala Ile Met	Gln Val Phe Phe		
2315	2320	2325		
Gly Tyr Phe Ala Ser His Phe	Ile Ser Asn Ser	Trp Leu Met Trp		
2330	2335	2340		
Phe Ile Ile Ser Ile Val Gln	Met Ala Pro Val	Ser Ala Met Val		
2345	2350	2355		
Arg Met Tyr Ile Phe Phe Ala	Ser Phe Tyr Tyr	Ile Trp Lys Ser		
2360	2365	2370		
Tyr Val His Ile Met Asp Gly	Cys Thr Ser Ser	Thr Cys Met Met		
2375	2380	2385		
Cys Tyr Lys Arg Asn Arg Ala	Thr Arg Val Glu	Cys Thr Thr Ile		
2390	2395	2400		
Val Asn Gly Met Lys Arg Ser	Phe Tyr Val Tyr	Ala Asn Gly Gly		
2405	2410	2415		
Arg Gly Phe Cys Lys Thr His	Asn Trp Asn Cys	Leu Asn Cys Asp		
2420	2425	2430		
Thr Phe Cys Thr Gly Ser Thr	Phe Ile Ser Asp	Glu Val Ala Arg		
2435	2440	2445		
Asp Leu Ser Leu Gln Phe Lys	Arg Pro Ile Asn	Pro Thr Asp Gln		
2450	2455	2460		
Ser Ser Tyr Ile Val Asp Ser	Val Ala Val Lys	Asn Gly Ala Leu		
2465	2470	2475		
His Leu Tyr Phe Asp Lys Ala	Gly Gln Lys Thr	Tyr Glu Arg His		
2480	2485	2490		
Pro Leu Ser His Phe Val Asn	Leu Asp Asn Leu	Arg Ala Asn Asn		
2495	2500	2505		

Thr	Lys	Gly	Ser	Leu	Pro	Ile	Asn	Val	Ile	Val	Phe	Asp	Gly	Lys
	2510					2515					2520			
Ser	Lys	Cys	Asp	Glu	Ser	Ala	Ser	Lys	Ser	Ala	Ser	Val	Tyr	Tyr
	2525					2530					2535			
Ser	Gln	Leu	Met	Cys	Gln	Pro	Ile	Leu	Leu	Leu	Asp	Gln	Ala	Leu
	2540					2545					2550			
Val	Ser	Asp	Val	Gly	Asp	Ser	Thr	Glu	Val	Ser	Val	Lys	Met	Phe
	2555					2560					2565			
Asp	Ala	Tyr	Val	Asp	Thr	Phe	Ser	Ala	Thr	Phe	Ser	Val	Pro	Met
	2570					2575					2580			
Glu	Lys	Leu	Lys	Ala	Leu	Val	Ala	Thr	Ala	His	Ser	Glu	Leu	Ala
	2585					2590					2595			
Lys	Gly	Val	Ala	Leu	Asp	Gly	Val	Leu	Ser	Thr	Phe	Val	Ser	Ala
	2600					2605					2610			
Ala	Arg	Gln	Gly	Val	Val	Asp	Thr	Asp	Val	Asp	Thr	Lys	Asp	Val
	2615					2620					2625			
Ile	Glu	Cys	Leu	Lys	Leu	Ser	His	His	Ser	Asp	Leu	Glu	Val	Thr
	2630					2635					2640			
Gly	Asp	Ser	Cys	Asn	Asn	Phe	Met	Leu	Thr	Tyr	Asn	Lys	Val	Glu
	2645					2650					2655			
Asn	Met	Thr	Pro	Arg	Asp	Leu	Gly	Ala	Cys	Ile	Asp	Cys	Asn	Ala
	2660					2665					2670			
Arg	His	Ile	Asn	Ala	Gln	Val	Ala	Lys	Ser	His	Asn	Val	Ser	Leu
	2675					2680					2685			
Ile	Trp	Asn	Val	Lys	Asp	Tyr	Met	Ser	Leu	Ser	Glu	Gln	Leu	Arg
	2690					2695					2700			
Lys	Gln	Ile	Arg	Ser	Ala	Ala	Lys	Lys	Asn	Asn	Ile	Pro	Phe	Arg
	2705					2710					2715			
Leu	Thr	Cys	Ala	Thr	Thr	Arg	Gln	Val	Val	Asn	Val	Ile	Thr	Thr
	2720					2725					2730			

Lys Ile	Ser Leu	Lys Gly	Gly	Lys Ile	Val Ser	Thr	Trp Phe	Lys
2735			2740			2745		
Leu Met	Leu Lys	Ala Thr	Leu	Leu Cys	Val Leu	Ala	Ala Leu	Val
2750			2755			2760		
Cys Tyr	Ile Val	Met Pro	Val	His Thr	Leu Ser	Ile	His Asp	Gly
2765			2770			2775		
Tyr Thr	Asn Glu	Ile Ile	Gly	Tyr Lys	Ala Ile	Gln	Asp Gly	Val
2780			2785			2790		
Thr Arg	Asp Ile	Ile Ser	Thr	Asp Asp	Cys Phe	Ala	Asn Lys	His
2795			2800			2805		
Ala Gly	Phe Asp	Ala Trp	Phe	Ser Gln	Arg Gly	Gly	Ser Tyr	Lys
2810			2815			2820		
Asn Asp	Lys Ser	Cys Pro	Val	Val Ala	Ala Ile	Ile	Thr Arg	Glu
2825			2830			2835		
Ile Gly	Phe Ile	Val Pro	Gly	Leu Pro	Gly Thr	Val	Leu Arg	Ala
2840			2845			2850		
Ile Asn	Gly Asp	Phe Leu	His	Phe Leu	Pro Arg	Val	Phe Ser	Ala
2855			2860			2865		
Val Gly	Asn Ile	Cys Tyr	Thr	Pro Ser	Lys Leu	Ile	Glu Tyr	Ser
2870			2875			2880		
Asp Phe	Ala Thr	Ser Ala	Cys	Val Leu	Ala Ala	Glu	Cys Thr	Ile
2885			2890			2895		
Phe Lys	Asp Ala	Met Gly	Lys	Pro Val	Pro Tyr	Cys	Tyr Asp	Thr
2900			2905			2910		
Asn Leu	Leu Glu	Gly Ser	Ile	Ser Tyr	Ser Glu	Leu	Arg Pro	Asp
2915			2920			2925		
Thr Arg	Tyr Val	Leu Met	Asp	Gly Ser	Ile Ile	Gln	Phe Pro	Asn
2930			2935			2940		
Ile Tyr	Leu Glu	Gly Ser	Val	Arg Val	Val Thr	Thr	Phe Asp	Ala
2945			2950			2955		

Glu Tyr Cys Arg His Gly Thr Cys Glu Arg Ser Glu Ala Gly Ile 2960 2965 2970
Cys Leu Ser Thr Ser Gly Arg Trp Val Leu Asn Asn Glu His Tyr 2975 2980 2985
Arg Ala Leu Ser Gly Val Phe Cys Gly Val Asp Ala Met Asn Leu 2990 2995 3000
Ile Ala Asn Ile Phe Thr Pro Leu Val Gln Pro Val Gly Ala Leu 3005 3010 3015
Asp Val Ser Ala Ser Val Val Ala Gly Gly Ile Ile Ala Ile Leu 3020 3025 3030
Val Thr Cys Ala Ala Tyr Tyr Phe Met Lys Phe Arg Arg Ala Phe 3035 3040 3045
Gly Glu Tyr Asn His Val Val Ala Ala Asn Ala Leu Leu Phe Leu 3050 3055 3060
Met Ser Phe Thr Ile Leu Cys Leu Ala Pro Ala Tyr Ser Phe Leu 3065 3070 3075
Pro Gly Val Tyr Ser Val Phe Tyr Leu Tyr Leu Thr Phe Tyr Phe 3080 3085 3090
Thr Asn Asp Val Ser Phe Leu Ala His Leu Gln Trp Phe Ala Met 3095 3100 3105
Phe Ser Pro Ile Val Pro Phe Trp Ile Thr Ala Ile Tyr Val Phe 3110 3115 3120
Cys Ile Ser Leu Lys His Cys His Trp Phe Phe Asn Asn Tyr Leu 3125 3130 3135
Arg Lys Arg Val Met Phe Asn Gly Val Thr Phe Ser Thr Phe Glu 3140 3145 3150
Glu Ala Ala Leu Cys Thr Phe Leu Leu Asn Lys Glu Met Tyr Leu 3155 3160 3165
Lys Leu Arg Ser Glu Thr Leu Leu Pro Leu Thr Gln Tyr Asn Arg

3170		3175		3180
Tyr Leu Ala Leu Tyr Asn Lys	Tyr Lys Tyr Phe Ser Gly Ala Leu			
3185	3190	3195		
Asp Thr Thr Ser Tyr Arg Glu	Ala Ala Cys Cys His Leu Ala Lys			
3200	3205	3210		
Ala Leu Asn Asp Phe Ser Asn	Ser Gly Ala Asp Val Leu Tyr Gln			
3215	3220	3225		
Pro Pro Gln Thr Ser Ile Thr	Ser Ala Val Leu Gln Ser Gly Phe			
3230	3235	3240		
Arg Lys Met Ala Phe Pro Ser	Gly Lys Val Glu Gly Cys Met Val			
3245	3250	3255		
Gln Val Thr Cys Gly Thr Thr	Thr Leu Asn Gly Leu Trp Leu Asp			
3260	3265	3270		
Asp Thr Val Tyr Cys Pro Arg	His Val Ile Cys Thr Ala Glu Asp			
3275	3280	3285		
Met Leu Asn Pro Asn Tyr Glu	Asp Leu Leu Ile Arg Lys Ser Asn			
3290	3295	3300		
His Ser Phe Leu Val Gln Ala	Gly Asn Val Gln Leu Arg Val Ile			
3305	3310	3315		
Gly His Ser Met Gln Asn Cys	Leu Leu Arg Leu Lys Val Asp Thr			
3320	3325	3330		
Ser Asn Pro Lys Thr Pro Lys	Tyr Lys Phe Val Arg Ile Gln Pro			
3335	3340	3345		
Gly Gln Thr Phe Ser Val Leu	Ala Cys Tyr Asn Gly Ser Pro Ser			
3350	3355	3360		
Gly Val Tyr Gln Cys Ala Met	Arg Pro Asn His Thr Ile Lys Gly			
3365	3370	3375		
Ser Phe Leu Asn Gly Ser Cys	Gly Ser Val Gly Phe Asn Ile Asp			
3380	3385	3390		

Tyr	Asp	Cys	Val	Ser	Phe	Cys	Tyr	Met	His	His	Met	Glu	Leu	Pro
3395						3400					3405			
Thr	Gly	Val	His	Ala	Gly	Thr	Asp	Leu	Glu	Gly	Lys	Phe	Tyr	Gly
3410						3415					3420			
Pro	Phe	Val	Asp	Arg	Gln	Thr	Ala	Gln	Ala	Ala	Gly	Thr	Asp	Thr
3425						3430					3435			
Thr	Ile	Thr	Leu	Asn	Val	Leu	Ala	Trp	Leu	Tyr	Ala	Ala	Val	Ile
3440						3445					3450			
Asn	Gly	Asp	Arg	Trp	Phe	Leu	Asn	Arg	Phe	Thr	Thr	Thr	Leu	Asn
3455						3460					3465			
Asp	Phe	Asn	Leu	Val	Ala	Met	Lys	Tyr	Asn	Tyr	Glu	Pro	Leu	Thr
3470						3475					3480			
Gln	Asp	His	Val	Asp	Ile	Leu	Gly	Pro	Leu	Ser	Ala	Gln	Thr	Gly
3485						3490					3495			
Ile	Ala	Val	Leu	Asp	Met	Cys	Ala	Ala	Leu	Lys	Glu	Leu	Leu	Gln
3500						3505					3510			
Asn	Gly	Met	Asn	Gly	Arg	Thr	Ile	Leu	Gly	Ser	Thr	Ile	Leu	Glu
3515						3520					3525			
Asp	Glu	Phe	Thr	Pro	Phe	Asp	Val	Val	Arg	Gln	Cys	Ser	Gly	Val
3530						3535					3540			
Thr	Phe	Gln	Gly	Lys	Phe	Lys	Lys	Ile	Val	Lys	Gly	Thr	His	His
3545						3550					3555			
Trp	Met	Leu	Leu	Thr	Phe	Leu	Thr	Ser	Leu	Leu	Ile	Leu	Val	Gln
3560						3565					3570			
Ser	Thr	Gln	Trp	Ser	Leu	Phe	Phe	Phe	Val	Tyr	Glu	Asn	Ala	Phe
3575						3580					3585			
Leu	Pro	Phe	Thr	Leu	Gly	Ile	Met	Ala	Ile	Ala	Ala	Cys	Ala	Met
3590						3595					3600			
Leu	Leu	Val	Lys	His	Lys	His	Ala	Phe	Leu	Cys	Leu	Phe	Leu	Leu
3605						3610					3615			

Pro Ser Leu Ala Thr Val Ala Tyr Phe Asn Met Val Tyr Met Pro
 3620 3625 3630

Ala Ser Trp Val Met Arg Ile Met Thr Trp Leu Glu Leu Ala Asp
 3635 3640 3645

Thr Ser Leu Ser Gly Tyr Arg Leu Lys Asp Cys Val Met Tyr Ala
 3650 3655 3660

Ser Ala Leu Val Leu Leu Ile Leu Met Thr Ala Arg Thr Val Tyr
 3665 3670 3675

Asp Asp Ala Ala Arg Arg Val Trp Thr Leu Met Asn Val Ile Thr
 3680 3685 3690

Leu Val Tyr Lys Val Tyr Tyr Gly Asn Ala Leu Asp Gln Ala Ile
 3695 3700 3705

Ser Met Trp Ala Leu Val Ile Ser Val Thr Ser Asn Tyr Ser Gly
 3710 3715 3720

Val Val Thr Thr Ile Met Phe Leu Ala Arg Ala Ile Val Phe Val
 3725 3730 3735

Cys Val Glu Tyr Tyr Pro Leu Leu Phe Ile Thr Gly Asn Thr Leu
 3740 3745 3750

Gln Cys Ile Met Leu Val Tyr Cys Phe Leu Gly Tyr Cys Cys Cys
 3755 3760 3765

Cys Tyr Phe Gly Leu Phe Cys Leu Leu Asn Arg Tyr Phe Arg Leu
 3770 3775 3780

Thr Leu Gly Val Tyr Asp Tyr Leu Val Ser Thr Gln Glu Phe Arg
 3785 3790 3795

Tyr Met Asn Ser Gln Gly Leu Leu Pro Pro Lys Ser Ser Ile Asp
 3800 3805 3810

Ala Phe Lys Leu Asn Ile Lys Leu Leu Gly Ile Gly Gly Lys Pro
 3815 3820 3825

Cys Ile Lys Val Ala Thr Val Gln Ser Lys Met Ser Asp Val Lys
 3830 3835 3840

Cys Thr Ser Val Val Leu Leu Ser Val Leu Gln Gln Leu Arg Val
 3845 3850 3855

Glu Ser Ser Ser Lys Leu Trp Ala Gln Cys Val Gln Leu His Asn
 3860 3865 3870

Asp Ile Leu Leu Ala Lys Asp Thr Thr Glu Ala Phe Glu Lys Met
 3875 3880 3885

Val Ser Leu Leu Ser Val Leu Leu Ser Met Gln Gly Ala Val Asp
 3890 3895 3900

Ile Asn Arg Leu Cys Glu Glu Met Leu Asp Asn Arg Ala Thr Leu
 3905 3910 3915

Gln Ala Ile Ala Ser Glu Phe Ser Ser Leu Pro Ser Tyr Ala Ala
 3920 3925 3930

Tyr Ala Thr Ala Gln Glu Ala Tyr Glu Gln Ala Val Ala Asn Gly
 3935 3940 3945

Asp Ser Glu Val Val Leu Lys Lys Leu Lys Lys Ser Leu Asn Val
 3950 3955 3960

Ala Lys Ser Glu Phe Asp Arg Asp Ala Ala Met Gln Arg Lys Leu
 3965 3970 3975

Glu Lys Met Ala Asp Gln Ala Met Thr Gln Met Tyr Lys Gln Ala
 3980 3985 3990

Arg Ser Glu Asp Lys Arg Ala Lys Val Thr Ser Ala Met Gln Thr
 3995 4000 4005

Met Leu Phe Thr Met Leu Arg Lys Leu Asp Asn Asp Ala Leu Asn
 4010 4015 4020

Asn Ile Ile Asn Asn Ala Arg Asp Gly Cys Val Pro Leu Asn Ile
 4025 4030 4035

Ile Pro Leu Thr Thr Ala Ala Lys Leu Met Val Val Val Pro Asp
 4040 4045 4050

Tyr Gly Thr Tyr Lys Asn Thr Cys Asp Gly Asn Thr Phe Thr Tyr

4055	4060	4065
Ala Ser Ala Leu Trp Glu Ile Gln Gln Val Val Asp Ala Asp Ser 4070 4075 4080		
Lys Ile Val Gln Leu Ser Glu Ile Asn Met Asp Asn Ser Pro Asn 4085 4090 4095		
Leu Ala Trp Pro Leu Ile Val Thr Ala Leu Arg Ala Asn Ser Ala 4100 4105 4110		
Val Lys Leu Gln Asn Asn Glu Leu Ser Pro Val Ala Leu Arg Gln 4115 4120 4125		
Met Ser Cys Ala Ala Gly Thr Thr Gln Thr Ala Cys Thr Asp Asp 4130 4135 4140		
Asn Ala Leu Ala Tyr Tyr Asn Asn Ser Lys Gly Gly Arg Phe Val 4145 4150 4155		
Leu Ala Leu Leu Ser Asp His Gln Asp Leu Lys Trp Ala Arg Phe 4160 4165 4170		
Pro Lys Ser Asp Gly Thr Gly Thr Ile Tyr Thr Glu Leu Glu Pro 4175 4180 4185		
Pro Cys Arg Phe Val Thr Asp Thr Pro Lys Gly Pro Lys Val Lys 4190 4195 4200		
Tyr Leu Tyr Phe Ile Lys Gly Leu Asn Asn Leu Asn Arg Gly Met 4205 4210 4215		
Val Leu Gly Ser Leu Ala Ala Thr Val Arg Leu Gln Ala Gly Asn 4220 4225 4230		
Ala Thr Glu Val Pro Ala Asn Ser Thr Val Leu Ser Phe Cys Ala 4235 4240 4245		
Phe Ala Val Asp Pro Ala Lys Ala Tyr Lys Asp Tyr Leu Ala Ser 4250 4255 4260		
Gly Gly Gln Pro Ile Thr Asn Cys Val Lys Met Leu Cys Thr His 4265 4270 4275		

Thr	Gly	Thr	Gly	Gln	Ala	Ile	Thr	Val	Thr	Pro	Glu	Ala	Asn	Met
4280						4285					4290			
Asp	Gln	Glu	Ser	Phe	Gly	Gly	Ala	Ser	Cys	Cys	Leu	Tyr	Cys	Arg
4295						4300					4305			
Cys	His	Ile	Asp	His	Pro	Asn	Pro	Lys	Gly	Phe	Cys	Asp	Leu	Lys
4310						4315					4320			
Gly	Lys	Tyr	Val	Gln	Ile	Pro	Thr	Thr	Cys	Ala	Asn	Asp	Pro	Val
4325						4330					4335			
Gly	Phe	Thr	Leu	Arg	Asn	Thr	Val	Cys	Thr	Val	Cys	Gly	Met	Trp
4340						4345					4350			
Lys	Gly	Tyr	Gly	Cys	Ser	Cys	Asp	Gln	Leu	Arg	Glu	Pro	Leu	Met
4355						4360					4365			
Gln	Ser	Ala	Asp	Ala	Ser	Thr	Phe	Leu	Asn	Arg	Val	Cys	Gly	Val
4370						4375					4380			
Ser	Ala	Ala	Arg	Leu	Thr	Pro	Cys	Gly	Thr	Gly	Thr	Ser	Thr	Asp
4385						4390					4395			
Val	Val	Tyr	Arg	Ala	Phe	Asp	Ile	Tyr	Asn	Glu	Lys	Val	Ala	Gly
4400						4405					4410			
Phe	Ala	Lys	Phe	Leu	Lys	Thr	Asn	Cys	Cys	Arg	Phe	Gln	Glu	Lys
4415						4420					4425			
Asp	Glu	Glu	Gly	Asn	Leu	Leu	Asp	Ser	Tyr	Phe	Val	Val	Lys	Arg
4430						4435					4440			
His	Thr	Met	Ser	Asn	Tyr	Gln	His	Glu	Glu	Thr	Ile	Tyr	Asn	Leu
4445						4450					4455			
Val	Lys	Asp	Cys	Pro	Ala	Val	Ala	Val	His	Asp	Phe	Phe	Lys	Phe
4460						4465					4470			
Arg	Val	Asp	Gly	Asp	Met	Val	Pro	His	Ile	Ser	Arg	Gln	Arg	Leu
4475						4480					4485			
Thr	Lys	Tyr	Thr	Met	Ala	Asp	Leu	Val	Tyr	Ala	Leu	Arg	His	Phe
4490						4495					4500			

Asp	Glu	Gly	Asn	Cys	Asp	Thr	Leu	Lys	Glu	Ile	Leu	Val	Thr	Tyr
4505						4510					4515			
Asn	Cys	Cys	Asp	Asp	Asp	Tyr	Phe	Asn	Lys	Lys	Asp	Trp	Tyr	Asp
4520						4525					4530			
Phe	Val	Glu	Asn	Pro	Asp	Ile	Leu	Arg	Val	Tyr	Ala	Asn	Leu	Gly
4535						4540					4545			
Glu	Arg	Val	Arg	Gln	Ser	Leu	Leu	Lys	Thr	Val	Gln	Phe	Cys	Asp
4550						4555					4560			
Ala	Met	Arg	Asp	Ala	Gly	Ile	Val	Gly	Val	Leu	Thr	Leu	Asp	Asn
4565						4570					4575			
Gln	Asp	Leu	Asn	Gly	Asn	Trp	Tyr	Asp	Phe	Gly	Asp	Phe	Val	Gln
4580						4585					4590			
Val	Ala	Pro	Gly	Cys	Gly	Val	Pro	Ile	Val	Asp	Ser	Tyr	Tyr	Ser
4595						4600					4605			
Leu	Leu	Met	Pro	Ile	Leu	Thr	Leu	Thr	Arg	Ala	Leu	Ala	Ala	Glu
4610						4615					4620			
Ser	His	Met	Asp	Ala	Asp	Leu	Ala	Lys	Pro	Leu	Ile	Lys	Trp	Asp
4625						4630					4635			
Leu	Leu	Lys	Tyr	Asp	Phe	Thr	Glu	Glu	Arg	Leu	Cys	Leu	Phe	Asp
4640						4645					4650			
Arg	Tyr	Phe	Lys	Tyr	Trp	Asp	Gln	Thr	Tyr	His	Pro	Asn	Cys	Ile
4655						4660					4665			
Asn	Cys	Leu	Asp	Asp	Arg	Cys	Ile	Leu	His	Cys	Ala	Asn	Phe	Asn
4670						4675					4680			
Val	Leu	Phe	Ser	Thr	Val	Phe	Pro	Pro	Thr	Ser	Phe	Gly	Pro	Leu
4685						4690					4695			
Val	Arg	Lys	Ile	Phe	Val	Asp	Gly	Val	Pro	Phe	Val	Val	Ser	Thr
4700						4705					4710			
Gly	Tyr	His	Phe	Arg	Glu	Leu	Gly	Val	Val	His	Asn	Gln	Asp	Val
4715						4720					4725			

Asn Leu His Ser Ser Arg Leu Ser Phe Lys Glu Leu Leu Val Tyr
 4730 4735 4740

Ala Ala Asp Pro Ala Met His Ala Ala Ser Gly Asn Leu Leu Leu
 4745 4750 4755

Asp Lys Arg Thr Thr Cys Phe Ser Val Ala Ala Leu Thr Asn Asn
 4760 4765 4770

Val Ala Phe Gln Thr Val Lys Pro Gly Asn Phe Asn Lys Asp Phe
 4775 4780 4785

Tyr Asp Phe Ala Val Ser Lys Gly Phe Phe Lys Glu Gly Ser Ser
 4790 4795 4800

Val Glu Leu Lys His Phe Phe Phe Ala Gln Asp Gly Asn Ala Ala
 4805 4810 4815

Ile Ser Asp Tyr Asp Tyr Tyr Arg Tyr Asn Leu Pro Thr Met Cys
 4820 4825 4830

Asp Ile Arg Gln Leu Leu Phe Val Val Glu Val Val Asp Lys Tyr
 4835 4840 4845

Phe Asp Cys Tyr Asp Gly Gly Cys Ile Asn Ala Asn Gln Val Ile
 4850 4855 4860

Val Asn Asn Leu Asp Lys Ser Ala Gly Phe Pro Phe Asn Lys Trp
 4865 4870 4875

Gly Lys Ala Arg Leu Tyr Tyr Asp Ser Met Ser Tyr Glu Asp Gln
 4880 4885 4890

Asp Ala Leu Phe Ala Tyr Thr Lys Arg Asn Val Ile Pro Thr Ile
 4895 4900 4905

Thr Gln Met Asn Leu Lys Tyr Ala Ile Ser Ala Lys Asn Arg Ala
 4910 4915 4920

Arg Thr Val Ala Gly Val Ser Ile Cys Ser Thr Met Thr Asn Arg
 4925 4930 4935

Gln Phe His Gln Lys Leu Leu Lys Ser Ile Ala Ala Thr Arg Gly

4940	4945	4950
Ala Thr Val Val Ile Gly Thr 4955	Ser Lys Phe Tyr Gly 4960	Gly Gly Trp His 4965
Asn Met Leu Lys Thr Val Tyr 4970	Ser Asp Val Glu Thr 4975	Pro His Leu 4980
Met Gly Trp Asp Tyr Pro Lys 4985	Cys Asp Arg Ala Met 4990	Pro Asn Met 4995
Leu Arg Ile Met Ala Ser 5000	Leu Val Leu Ala Arg 5005	Lys His Asn Thr 5010
Cys Cys Asn Leu Ser His 5015	Arg Phe Tyr Arg Leu 5020	Ala Asn Glu Cys 5025
Ala Gln Val Leu Ser Glu 5030	Met Val Met Cys Gly 5035	Gly Ser Leu Tyr 5040
Val Lys Pro Gly Gly Thr 5045	Ser Ser Gly Asp Ala 5050	Thr Thr Ala Tyr 5055
Ala Asn Ser Val Phe Asn 5060	Ile Cys Gln Ala Val 5065	Thr Ala Asn Val 5070
Asn Ala Leu Leu Ser Thr 5075	Asp Gly Asn Lys Ile 5080	Ala Asp Lys Tyr 5085
Val Arg Asn Leu Gln His 5090	Arg Leu Tyr Glu Cys 5095	Leu Tyr Arg Asn 5100
Arg Asp Val Asp His Glu 5105	Phe Val Asp Glu Phe 5110	Tyr Ala Tyr Leu 5115
Arg Lys His Phe Ser Met 5120	Met Ile Leu Ser Asp 5125	Asp Ala Val Val 5130
Cys Tyr Asn Ser Asn Tyr 5135	Ala Ala Gln Gly Leu 5140	Val Ala Ser Ile 5145
Lys Asn Phe Lys Ala Val 5150	Leu Tyr Tyr Gln Asn 5155	Asn Val Phe Met 5160

Ser	Glu	Ala	Lys	Cys	Trp	Thr	Glu	Thr	Asp	Leu	Thr	Lys	Gly	Pro
5165						5170					5175			
His	Glu	Phe	Cys	Ser	Gln	His	Thr	Met	Leu	Val	Lys	Gln	Gly	Asp
5180						5185					5190			
Asp	Tyr	Val	Tyr	Leu	Pro	Tyr	Pro	Asp	Pro	Ser	Arg	Ile	Leu	Gly
5195						5200					5205			
Ala	Gly	Cys	Phe	Val	Asp	Asp	Ile	Val	Lys	Thr	Asp	Gly	Thr	Leu
5210						5215					5220			
Met	Ile	Glu	Arg	Phe	Val	Ser	Leu	Ala	Ile	Asp	Ala	Tyr	Pro	Leu
5225						5230					5235			
Thr	Lys	His	Pro	Asn	Gln	Glu	Tyr	Ala	Asp	Val	Phe	His	Leu	Tyr
5240						5245					5250			
Leu	Gln	Tyr	Ile	Arg	Lys	Leu	His	Asp	Glu	Leu	Thr	Gly	His	Met
5255						5260					5265			
Leu	Asp	Met	Tyr	Ser	Val	Met	Leu	Thr	Asn	Asp	Asn	Thr	Ser	Arg
5270						5275					5280			
Tyr	Trp	Glu	Pro	Glu	Phe	Tyr	Glu	Ala	Met	Tyr	Thr	Pro	His	Thr
5285						5290					5295			
Val	Leu	Gln	Ala	Val	Gly	Ala	Cys	Val	Leu	Cys	Asn	Ser	Gln	Thr
5300						5305					5310			
Ser	Leu	Arg	Cys	Gly	Ala	Cys	Ile	Arg	Arg	Pro	Phe	Leu	Cys	Cys
5315						5320					5325			
Lys	Cys	Cys	Tyr	Asp	His	Val	Ile	Ser	Thr	Ser	His	Lys	Leu	Val
5330						5335					5340			
Leu	Ser	Val	Asn	Pro	Tyr	Val	Cys	Asn	Ala	Pro	Gly	Cys	Asp	Val
5345						5350					5355			
Thr	Asp	Val	Thr	Gln	Leu	Tyr	Leu	Gly	Gly	Met	Ser	Tyr	Tyr	Cys
5360						5365					5370			
Lys	Ser	His	Lys	Pro	Pro	Ile	Ser	Phe	Pro	Leu	Cys	Ala	Asn	Gly
5375						5380					5385			

Gln Val Phe Gly Leu Tyr Lys Asn Thr Cys Val Gly Ser Asp Asn
5390 5395 5400

Val Thr Asp Phe Asn Ala Ile Ala Thr Cys Asp Trp Thr Asn Ala
5405 5410 5415

Gly Asp Tyr Ile Leu Ala Asn Thr Cys Thr Glu Arg Leu Lys Leu
5420 5425 5430

Phe Ala Ala Glu Thr Leu Lys Ala Thr Glu Glu Thr Phe Lys Leu
5435 5440 5445

Ser Tyr Gly Ile Ala Thr Val Arg Glu Val Leu Ser Asp Arg Glu
5450 5455 5460

Leu His Leu Ser Trp Glu Val Gly Lys Pro Arg Pro Pro Leu Asn
5465 5470 5475

Arg Asn Tyr Val Phe Thr Gly Tyr Arg Val Thr Lys Asn Ser Lys
5480 5485 5490

Val Gln Ile Gly Glu Tyr Thr Phe Glu Lys Gly Asp Tyr Gly Asp
5495 5500 5505

Ala Val Val Tyr Arg Gly Thr Thr Thr Tyr Lys Leu Asn Val Gly
5510 5515 5520

Asp Tyr Phe Val Leu Thr Ser His Thr Val Met Pro Leu Ser Ala
5525 5530 5535

Pro Thr Leu Val Pro Gln Glu His Tyr Val Arg Ile Thr Gly Leu
5540 5545 5550

Tyr Pro Thr Leu Asn Ile Ser Asp Glu Phe Ser Ser Asn Val Ala
5555 5560 5565

Asn Tyr Gln Lys Val Gly Met Gln Lys Tyr Ser Thr Leu Gln Gly
5570 5575 5580

Pro Pro Gly Thr Gly Lys Ser His Phe Ala Ile Gly Leu Ala Leu
5585 5590 5595

Tyr Tyr Pro Ser Ala Arg Ile Val Tyr Thr Ala Cys Ser His Ala
5600 5605 5610

Ala Val Asp Ala Leu Cys Glu Lys Ala Ser Lys Tyr Leu Pro Ile
5615 5620 5625

Asp Lys Cys Ser Arg Ile Ile Pro Ala Arg Ala Arg Val Glu Cys
5630 5635 5640

Phe Asp Lys Phe Lys Val Asn Ser Thr Leu Glu Gln Tyr Val Phe
5645 5650 5655

Cys Thr Val Asn Ala Leu Pro Glu Thr Thr Ala Asp Ile Val Val
5660 5665 5670

Phe Asp Glu Ile Ser Met Ala Thr Asn Tyr Asp Leu Ser Val Val
5675 5680 5685

Asn Ala Arg Leu Arg Ala Lys His Tyr Val Tyr Ile Gly Asp Pro
5690 5695 5700

Ala Gln Leu Pro Ala Pro Arg Thr Leu Leu Thr Lys Gly Thr Leu
5705 5710 5715

Glu Pro Glu Tyr Phe Asn Ser Val Cys Arg Leu Met Lys Thr Ile
5720 5725 5730

Gly Pro Asp Met Phe Leu Gly Thr Cys Arg Arg Cys Pro Ala Glu
5735 5740 5745

Ile Val Asp Thr Val Ser Ala Leu Val Tyr Asp Asn Lys Leu Lys
5750 5755 5760

Ala His Lys Glu Lys Ser Ala Gln Cys Phe Lys Met Phe Tyr Lys
5765 5770 5775

Gly Val Ile Thr His Asp Val Ser Ser Ala Ile Asn Arg Pro Gln
5780 5785 5790

Ile Gly Val Val Arg Glu Phe Leu Thr Arg Asn Pro Ala Trp Arg
5795 5800 5805

Lys Ala Val Phe Ile Ser Pro Tyr Asn Ser Gln Asn Ala Val Ala
5810 5815 5820

Ser Lys Ile Leu Gly Leu Pro Thr Gln Thr Val Asp Ser Ser Gln

5825		5830		5835
Gly Ser Glu Tyr Asp Tyr Val Ile Phe Thr Gln Thr Thr Glu Thr				
5840		5845		5850
Ala His Ser Cys Asn Val Asn Arg Phe Asn Val Ala Ile Thr Arg				
5855		5860		5865
Ala Lys Ile Gly Ile Leu Cys Ile Met Ser Asp Arg Asp Leu Tyr				
5870		5875		5880
Asp Lys Leu Gln Phe Thr Ser Leu Glu Ile Pro Arg Arg Asn Val				
5885		5890		5895
Ala Thr Leu Gln Ala Glu Asn Val Thr Gly Leu Phe Lys Asp Cys				
5900		5905		5910
Ser Lys Ile Ile Thr Gly Leu His Pro Thr Gln Ala Pro Thr His				
5915		5920		5925
Leu Ser Val Asp Ile Lys Phe Lys Thr Glu Gly Leu Cys Val Asp				
5930		5935		5940
Ile Pro Gly Ile Pro Lys Asp Met Thr Tyr Arg Arg Leu Ile Ser				
5945		5950		5955
Met Met Gly Phe Lys Met Asn Tyr Gln Val Asn Gly Tyr Pro Asn				
5960		5965		5970
Met Phe Ile Thr Arg Glu Glu Ala Ile Arg His Val Arg Ala Trp				
5975		5980		5985
Ile Gly Phe Asp Val Glu Gly Cys His Ala Thr Arg Asp Ala Val				
5990		5995		6000
Gly Thr Asn Leu Pro Leu Gln Leu Gly Phe Ser Thr Gly Val Asn				
6005		6010		6015
Leu Val Ala Val Pro Thr Gly Tyr Val Asp Thr Glu Asn Asn Thr				
6020		6025		6030
Glu Phe Thr Arg Val Asn Ala Lys Pro Pro Pro Gly Asp Gln Phe				
6035		6040		6045

Lys	His	Leu	Ile	Pro	Leu	Met	Tyr	Lys	Gly	Leu	Pro	Trp	Asn	Val
6050						6055					6060			
Val	Arg	Ile	Lys	Ile	Val	Gln	Met	Leu	Ser	Asp	Thr	Leu	Lys	Gly
6065						6070					6075			
Leu	Ser	Asp	Arg	Val	Val	Phe	Val	Leu	Trp	Ala	His	Gly	Phe	Glu
6080						6085					6090			
Leu	Thr	Ser	Met	Lys	Tyr	Phe	Val	Lys	Ile	Gly	Pro	Glu	Arg	Thr
6095						6100					6105			
Cys	Cys	Leu	Cys	Asp	Lys	Arg	Ala	Thr	Cys	Phe	Ser	Thr	Ser	Ser
6110						6115					6120			
Asp	Thr	Tyr	Ala	Cys	Trp	Asn	His	Ser	Val	Gly	Phe	Asp	Tyr	Val
6125						6130					6135			
Tyr	Asn	Pro	Phe	Met	Ile	Asp	Val	Gln	Gln	Trp	Gly	Phe	Thr	Gly
6140						6145					6150			
Asn	Leu	Gln	Ser	Asn	His	Asp	Gln	His	Cys	Gln	Val	His	Gly	Asn
6155						6160					6165			
Ala	His	Val	Ala	Ser	Cys	Asp	Ala	Ile	Met	Thr	Arg	Cys	Leu	Ala
6170						6175					6180			
Val	His	Glu	Cys	Phe	Val	Lys	Arg	Val	Asp	Trp	Ser	Val	Glu	Tyr
6185						6190					6195			
Pro	Ile	Ile	Gly	Asp	Glu	Leu	Arg	Val	Asn	Ser	Ala	Cys	Arg	Lys
6200						6205					6210			
Val	Gln	His	Met	Val	Val	Lys	Ser	Ala	Leu	Leu	Ala	Asp	Lys	Phe
6215						6220					6225			
Pro	Val	Leu	His	Asp	Ile	Gly	Asn	Pro	Lys	Ala	Ile	Lys	Cys	Val
6230						6235					6240			
Pro	Gln	Ala	Glu	Val	Glu	Trp	Lys	Phe	Tyr	Asp	Ala	Gln	Pro	Cys
6245						6250					6255			
Ser	Asp	Lys	Ala	Tyr	Lys	Ile	Glu	Glu	Leu	Phe	Tyr	Ser	Tyr	Ala
6260						6265					6270			

Thr	His	His	Asp	Lys	Phe	Thr	Asp	Gly	Val	Cys	Leu	Phe	Trp	Asn
6275						6280					6285			
Cys	Asn	Val	Asp	Arg	Tyr	Pro	Ala	Asn	Ala	Ile	Val	Cys	Arg	Phe
6290						6295					6300			
Asp	Thr	Arg	Val	Leu	Ser	Asn	Leu	Asn	Leu	Pro	Gly	Cys	Asp	Gly
6305						6310					6315			
Gly	Ser	Leu	Tyr	Val	Asn	Lys	His	Ala	Phe	His	Thr	Pro	Ala	Phe
6320						6325					6330			
Asp	Lys	Ser	Ala	Phe	Thr	Asn	Leu	Lys	Gln	Leu	Pro	Phe	Phe	Tyr
6335						6340					6345			
Tyr	Ser	Asp	Ser	Pro	Cys	Glu	Ser	His	Gly	Lys	Gln	Val	Val	Ser
6350						6355					6360			
Asp	Ile	Asp	Tyr	Val	Pro	Leu	Lys	Ser	Ala	Thr	Cys	Ile	Thr	Arg
6365						6370					6375			
Cys	Asn	Leu	Gly	Gly	Ala	Val	Cys	Arg	His	His	Ala	Asn	Glu	Tyr
6380						6385					6390			
Arg	Gln	Tyr	Leu	Asp	Ala	Tyr	Asn	Met	Met	Ile	Ser	Ala	Gly	Phe
6395						6400					6405			
Ser	Leu	Trp	Ile	Tyr	Lys	Gln	Phe	Asp	Thr	Tyr	Asn	Leu	Trp	Asn
6410						6415					6420			
Thr	Phe	Thr	Arg	Leu	Gln	Ser	Leu	Glu	Asn	Val	Ala	Tyr	Asn	Val
6425						6430					6435			
Val	Asn	Lys	Gly	His	Phe	Asp	Gly	His	Ala	Gly	Glu	Ala	Pro	Val
6440						6445					6450			
Ser	Ile	Ile	Asn	Asn	Ala	Val	Tyr	Thr	Lys	Val	Asp	Gly	Ile	Asp
6455						6460					6465			
Val	Glu	Ile	Phe	Glu	Asn	Lys	Thr	Thr	Leu	Pro	Val	Asn	Val	Ala
6470						6475					6480			
Phe	Glu	Leu	Trp	Ala	Lys	Arg	Asn	Ile	Lys	Pro	Val	Pro	Glu	Ile
6485						6490					6495			

Lys Ile	Leu Asn Asn Leu	Gly Val Asp Ile Ala Ala	Asn Thr Val
6500		6505	6510
Ile Trp	Asp Tyr Lys Arg	Glu Ala Pro Ala His Val	Ser Thr Ile
6515		6520	6525
Gly Val	Cys Thr Met Thr	Asp Ile Ala Lys Lys Pro	Thr Glu Ser
6530		6535	6540
Ala Cys	Ser Ser Leu Thr	Val Leu Phe Asp Gly Arg	Val Glu Gly
6545		6550	6555
Gln Val	Asp Leu Phe Arg	Asn Ala Arg Asn Gly Val	Leu Ile Thr
6560		6565	6570
Glu Gly	Ser Val Lys Gly	Leu Thr Pro Ser Lys Gly	Pro Ala Gln
6575		6580	6585
Ala Ser	Val Asn Gly Val	Thr Leu Ile Gly Glu Ser	Val Lys Thr
6590		6595	6600
Gln Phe	Asn Tyr Phe Lys	Lys Val Asp Gly Ile Ile	Gln Gln Leu
6605		6610	6615
Pro Glu	Thr Tyr Phe Thr	Gln Ser Arg Asp Leu Glu	Asp Phe Lys
6620		6625	6630
Pro Arg	Ser Gln Met Glu	Thr Asp Phe Leu Glu Leu	Ala Met Asp
6635		6640	6645
Glu Phe	Ile Gln Arg Tyr	Lys Leu Glu Gly Tyr Ala	Phe Glu His
6650		6655	6660
Ile Val	Tyr Gly Asp Phe	Ser His Gly Gln Leu Gly	Gly Leu His
6665		6670	6675
Leu Met	Ile Gly Leu Ala	Lys Arg Ser Gln Asp Ser	Pro Leu Lys
6680		6685	6690
Leu Glu	Asp Phe Ile Pro	Met Asp Ser Thr Val Lys	Asn Tyr Phe
6695		6700	6705
Ile Thr	Asp Ala Gln Thr	Gly Ser Ser Lys Cys Val	Cys Ser Val

6710		6715		6720
Ile Asp Leu Leu Leu Asp Asp Phe Val Glu Ile Ile Lys Ser Gln				
6725		6730		6735
Asp Leu Ser Val Ile Ser Lys Val Val Lys Val Thr Ile Asp Tyr				
6740		6745		6750
Ala Glu Ile Ser Phe Met Leu Trp Cys Lys Asp Gly His Val Glu				
6755		6760		6765
Thr Phe Tyr Pro Lys Leu Gln Ala Ser Gln Ala Trp Gln Pro Gly				
6770		6775		6780
Val Ala Met Pro Asn Leu Tyr Lys Met Gln Arg Met Leu Leu Glu				
6785		6790		6795
Lys Cys Asp Leu Gln Asn Tyr Gly Glu Asn Ala Val Ile Pro Lys				
6800		6805		6810
Gly Ile Met Met Asn Val Ala Lys Tyr Thr Gln Leu Cys Gln Tyr				
6815		6820		6825
Leu Asn Thr Leu Thr Leu Ala Val Pro Tyr Asn Met Arg Val Ile				
6830		6835		6840
His Phe Gly Ala Gly Ser Asp Lys Gly Val Ala Pro Gly Thr Ala				
6845		6850		6855
Val Leu Arg Gln Trp Leu Pro Thr Gly Thr Leu Leu Val Asp Ser				
6860		6865		6870
Asp Leu Asn Asp Phe Val Ser Asp Ala Asp Ser Thr Leu Ile Gly				
6875		6880		6885
Asp Cys Ala Thr Val His Thr Ala Asn Lys Trp Asp Leu Ile Ile				
6890		6895		6900
Ser Asp Met Tyr Asp Pro Lys Thr Lys His Val Thr Lys Glu Asn				
6905		6910		6915
Asp Ser Lys Glu Gly Phe Phe Thr Tyr Leu Cys Gly Phe Ile Lys				
6920		6925		6930

Gln Lys Leu Ala Leu Gly Gly Ser Ile Ala Val Lys Ile Thr Glu
6935 6940 6945

His Ser Trp Asn Ala Asp Leu Tyr Lys Leu Met Gly His Phe Ser
6950 6955 6960

Trp Trp Thr Ala Phe Val Thr Asn Val Asn Ala Ser Ser Ser Glu
6965 6970 6975

Ala Phe Leu Ile Gly Ala Asn Tyr Leu Gly Lys Pro Lys Glu Gln
6980 6985 6990

Ile Asp Gly Tyr Thr Met His Ala Asn Tyr Ile Phe Trp Arg Asn
6995 7000 7005

Thr Asn Pro Ile Gln Leu Ser Ser Tyr Ser Leu Phe Asp Met Ser
7010 7015 7020

Lys Phe Pro Leu Lys Leu Arg Gly Thr Ala Val Met Ser Leu Lys
7025 7030 7035

Glu Asn Gln Ile Asn Asp Met Ile Tyr Ser Leu Leu Glu Lys Gly
7040 7045 7050

Arg Leu Ile Ile Arg Glu Asn Asn Arg Val Val Val Ser Ser Asp
7055 7060 7065

Ile Leu Val Asn Asn
7070

<210> 9
<211> 653
<212> PRT
<213> SARS Coronaviruses (SARS-CoV)

<400> 9

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu
1 5 10 15

Asp Arg Cys Thr Thr Phe Asp Asp Val Gln Ala Pro Asn Tyr Thr Gln
20 25 30

His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg
35 40 45

Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser
50 55 60

Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Asp Asn Pro Val
65 70 75 80

Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn
85 90 95

Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln
100 105 110

Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Arg
115 120 125

Ser Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met
130 135 140

Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr
145 150 155 160

Phe Glu Tyr Ile Ser Asp Ala Leu Ser Leu Asp Val Ser Glu Lys Ser
165 170 175

Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly
180 185 190

Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp
195 200 205

Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu
210 215 220

Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Leu Pro
225 230 235 240

Ala Gln Asp Thr Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
245 250 255

Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
260 265 270

Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
275 280 285

Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
 290 295 300

Phe Arg Val Val Pro Ser Arg Asp Val Val Arg Phe Pro Asn Ile Thr
 305 310 315 320

Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser
 325 330 335

Val Tyr Ala Trp Val Arg Lys Arg Ile Ser Asn Cys Val Ala Asp Tyr
 340 345 350

Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly
 355 360 365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala
 370 375 380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly
 385 390 395 400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe
 405 410 415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser
 420 425 430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu
 435 440 445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly
 450 455 460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp
 465 470 475 480

Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val
 485 490 495

Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly
 500 505 510

Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn
 515 520 525

Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg
 530 535 540

Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp
 545 550 555 560

Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys
 565 570 575

Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser
 580 585 590

Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr
 595 600 605

Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr
 610 615 620

Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu
 625 630 635 640

His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly
 645 650

<210> 10
 <211> 623
 <212> PRT
 <213> SARS Coronaviruses (SARS-CoV)

<400> 10

Met Gly Cys Leu Ile Gly Ala Glu His Val Asp Thr Ser Tyr Glu Cys
 1 5 10 15

Asp Ile Pro Ile Gly Ala Gly Ile Cys Ala Ser Tyr His Thr Val Ser
 20 25 30

Leu Leu Arg Ser Thr Ser Gln Lys Ser Ile Val Ala Tyr Thr Met Ser
 35 40 45

Leu Gly Ala Asp Ser Ser Ile Ala Tyr Ser Asn Asn Thr Ile Ala Ile
 50 55 60

Pro Thr Asn Phe Ser Ile Ile Ile Thr Thr Glu Val Met Pro Val Ser
 65 70 75 80

Met Ala Lys Thr Ser Val Asp Cys Asn Met Tyr Ile Cys Gly Asp Ser
85 90 95

Thr Glu Cys Ala Asn Leu Leu Leu Gln Tyr Gly Ser Phe Cys Thr Gln
100 105 110

Leu Asn Arg Ala Leu Ser Gly Ile Ala Ala Glu Gln Asp Arg Asn Thr
115 120 125

Arg Glu Val Phe Ala Gln Val Lys Gln Met Tyr Lys Thr Pro Thr Leu
130 135 140

Glu Asp Phe Gly Gly Phe Asn Phe Ser Gln Ile Leu Pro Asp Pro Leu
145 150 155 160

Lys Leu Thr Lys Arg Ser Phe Ile Glu Asp Leu Leu Phe Asn Lys Val
165 170 175

Thr Leu Ala Asp Ala Gly Phe Met Lys Gln Tyr Gly Glu Cys Leu Gly
180 185 190

Asp Ile Asn Ala Arg Asp Leu Ile Cys Ala Gln Lys Phe Asn Gly Leu
195 200 205

Thr Val Leu Pro Pro Leu Leu Thr Asp Asp Met Ile Ala Ala Tyr Thr
210 215 220

Ala Ala Leu Val Ser Gly Thr Val Thr Ala Gly Trp Thr Phe Gly Ala
225 230 235 240

Gly Ala Ala Leu Gln Ile Pro Phe Ala Met Gln Met Ala Tyr Arg Phe
245 250 255

Asn Gly Ile Gly Val Thr Gln Asn Val Leu Tyr Glu Asn Gln Lys Gln
260 265 270

Ile Ala Asn Gln Phe Asn Lys Ala Ile Ser Gln Ile Gln Glu Ser Leu
275 280 285

Thr Thr Thr Ser Thr Ala Leu Gly Lys Leu Gln Asp Val Val Asn Gln
290 295 300

Asn Ala Gln Ala Leu Asn Thr Leu Val Lys Gln Leu Ser Ser Asn Phe

305		310		315		320									
Gly	Ala	Ile	Ser	Ser	Val	Leu	Asn	Asp	Ile	Leu	Ser	Arg	Leu	Asp	Lys
				325					330					335	
Val	Glu	Ala	Glu	Val	Gln	Ile	Asp	Arg	Leu	Ile	Thr	Gly	Arg	Leu	Gln
			340					345					350		
Ser	Leu	Gln	Thr	Tyr	Val	Thr	Gln	Gln	Leu	Ile	Arg	Ala	Ala	Glu	Ile
		355					360					365			
Arg	Ala	Ser	Ala	Asn	Leu	Ala	Ala	Thr	Lys	Met	Ser	Glu	Cys	Val	Leu
	370					375					380				
Gly	Gln	Ser	Lys	Arg	Val	Asp	Phe	Cys	Gly	Lys	Gly	Tyr	His	Leu	Met
385					390					395					400
Ser	Phe	Pro	Gln	Ala	Ala	Pro	His	Gly	Val	Val	Phe	Leu	His	Val	Met
			405						410					415	
Tyr	Val	Pro	Ser	Gln	Glu	Arg	Asn	Phe	Thr	Thr	Ala	Pro	Ala	Ile	Cys
		420						425					430		
His	Glu	Gly	Lys	Ala	Tyr	Phe	Pro	Arg	Glu	Gly	Val	Phe	Val	Phe	Asn
	435						440					445			
Gly	Thr	Ser	Trp	Phe	Thr	Thr	Gln	Arg	Asn	Phe	Phe	Ser	Pro	Gln	Ile
	450						455					460			
Ile	Thr	Thr	Asp	Asn	Thr	Phe	Val	Ser	Gly	Asn	Cys	Asp	Val	Val	Ile
465					470					475					480
Gly	Ile	Ile	Asn	Asn	Thr	Val	Tyr	Asp	Pro	Leu	Gln	Pro	Glu	Leu	Asp
			485						490					495	
Ser	Phe	Lys	Glu	Glu	Leu	Asp	Lys	Tyr	Phe	Lys	Asn	His	Thr	Ser	Pro
		500						505					510		
Asp	Val	Asp	Leu	Gly	Asp	Ile	Ser	Gly	Ile	Asn	Ala	Ser	Val	Val	Asn
	515						520					525			
Ile	Gln	Glu	Glu	Ile	Asp	Arg	Leu	Asn	Glu	Val	Ala	Lys	Asn	Leu	Asn
530						535					540				

Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr Glu Gln Tyr Ile
 545 550 555 560

Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile Ala Gly Leu Ile Ala
 565 570 575

Ile Val Met Val Thr Ile Leu Leu Cys Cys Met Thr Ser Cys Cys Ser
 580 585 590

Cys Leu Lys Gly Ala Cys Ser Cys Gly Ser Cys Cys Lys Phe Asp Glu
 595 600 605

Asp Asp Ser Glu Pro Val Leu Lys Gly Val Lys Leu His Tyr Thr
 610 615 620

<210> 11
 <211> 76
 <212> PRT
 <213> SARS Coronaviruses (SARS-CoV)

<400> 11

Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser
 1 5 10 15

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
 20 25 30

Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn
 35 40 45

Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn
 50 55 60

Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val
 65 70 75

<210> 12
 <211> 221
 <212> PRT
 <213> SARS Coronaviruses (SARS-CoV)

<400> 12

Met Ala Asp Asn Gly Thr Ile Thr Val Glu Glu Leu Lys Gln Leu Leu
 1 5 10 15

Glu Gln Trp Asn Leu Val Ile Gly Phe Leu Phe Leu Ala Trp Ile Met

20

25

30

Leu Leu Gln Phe Ala Tyr Ser Asn Arg Asn Arg Phe Leu Tyr Ile Ile
 35 40 45

Lys Leu Val Phe Leu Trp Leu Leu Trp Pro Val Thr Leu Ala Cys Phe
 50 55 60

Val Leu Ala Ala Val Tyr Arg Ile Asn Trp Val Thr Gly Gly Ile Ala
 65 70 75 80

Ile Ala Met Ala Cys Ile Val Gly Leu Met Trp Leu Ser Tyr Phe Val
 85 90 95

Ala Ser Phe Arg Leu Phe Ala Arg Thr Arg Ser Met Trp Ser Phe Asn
 100 105 110

Pro Glu Thr Asn Ile Leu Leu Asn Val Pro Leu Arg Gly Thr Ile Val
 115 120 125

Thr Arg Pro Leu Met Glu Ser Glu Leu Val Ile Gly Ala Val Ile Ile
 130 135 140

Arg Gly His Leu Arg Met Ala Gly His Ser Leu Gly Arg Cys Asp Ile
 145 150 155 160

Lys Asp Leu Pro Lys Glu Ile Thr Val Ala Thr Ser Arg Thr Leu Ser
 165 170 175

Tyr Tyr Lys Leu Gly Ala Ser Gln Arg Val Gly Thr Asp Ser Gly Phe
 180 185 190

Ala Ala Tyr Asn Arg Tyr Arg Ile Gly Asn Tyr Lys Leu Asn Thr Asp
 195 200 205

His Ala Gly Ser Asn Asp Asn Ile Ala Leu Leu Val Gln
 210 215 220

<210> 13

<211> 398

<212> PRT

<213> SARS Coronaviruses (SARS-CoV)

<400> 13

Met Asp Asn Asn Gln Asn Gly Gly Arg Asn Gly Ala Arg Pro Lys Gln

1	5	10	15
Arg Arg Pro Gln Gly Leu Pro Asn Asn Thr Ala Ser Trp Phe Thr Ala	20	25	30
Leu Thr Gln His Gly Lys Glu Glu Leu Arg Phe Pro Arg Gly Gln Gly	35	40	45
Val Pro Ile Asn Thr Asn Ser Gly Pro Asp Asp Gln Ile Gly Tyr Tyr	50	55	60
Arg Arg Ala Thr Arg Arg Val Arg Gly Gly Asp Gly Lys Met Lys Glu	65	70	75
Leu Ser Pro Arg Trp Tyr Phe Tyr Tyr Leu Gly Thr Gly Pro Glu Ala	85	90	95
Ser Leu Pro Tyr Gly Ala Asn Lys Glu Gly Ile Val Trp Val Ala Thr	100	105	110
Glu Gly Ala Leu Asn Thr Pro Lys Asp His Ile Gly Thr Arg Asn Pro	115	120	125
Asn Asn Asn Ala Ala Thr Val Leu Gln Leu Pro Gln Gly Thr Thr Leu	130	135	140
Pro Lys Gly Phe Tyr Ala Glu Gly Ser Arg Gly Gly Ser Gln Ala Ser	145	150	155
Ser Arg Ser Ser Ser Arg Ser Arg Gly Asn Ser Arg Asn Ser Thr Pro	165	170	175
Gly Ser Ser Arg Gly Asn Ser Pro Ala Arg Met Ala Ser Gly Gly Gly	180	185	190
Glu Thr Ala Leu Ala Leu Leu Leu Leu Asp Arg Leu Asn Gln Leu Glu	195	200	205
Ser Lys Val Ser Gly Lys Gly Gln Gln Gln Gln Gly Gln Thr Val Thr	210	215	220
Lys Lys Ser Ala Ala Glu Ala Ser Lys Lys Pro Arg Gln Glu Arg Thr	225	230	235
			240

Ala Thr Lys Gln Tyr Asn Val Thr Gln Ala Phe Gly Arg Arg Gly Pro
245 250 255

Glu Gln Thr Gln Gly Asn Phe Gly Asp Gln Asp Leu Ile Arg Gln Gly
260 265 270

Thr Asp Tyr Lys His Trp Pro Gln Ile Ala Gln Phe Ala Pro Ser Ala
275 280 285

Ser Ala Phe Phe Gly Met Ser Arg Ile Gly Met Glu Val Thr Pro Ser
290 295 300

Gly Thr Trp Leu Thr Tyr His Gly Ala Ile Lys Leu Asp Asp Lys Asp
305 310 315 320

Pro Gln Phe Lys Asp Asn Val Ile Leu Leu Asn Lys His Ile Asp Ala
325 330 335

Tyr Lys Thr Phe Pro Pro Thr Glu Pro Lys Lys Asp Lys Lys Lys Lys
340 345 350

Thr Asp Glu Ala Gln Pro Leu Pro Gln Arg Gln Lys Lys Gln Pro Thr
355 360 365

Val Thr Leu Leu Pro Ala Ala Asp Met Asp Asp Phe Ser Arg Gln Leu
370 375 380

Gln Asn Ser Met Ser Gly Ala Ser Ala Asp Ser Thr Gln Ala
385 390 395

<210> 14
<211> 91
<212> PRT
<213> SARS Coronaviruses (SARS-CoV)

<400> 14

Met Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser Leu His Lys Leu
1 5 10 15

Leu Gln Thr Leu Val Leu Lys Met Leu His Ser Ser Ser Leu Thr Ser
20 25 30

Leu Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln Ser Thr Ala Leu
35 40 45

Gln Glu Leu Gln Ile Gln Gln Trp Ile Gln Phe Met Met Ser Arg Arg
50 55 60

Arg Leu Leu Ala Cys Leu Cys Lys His Lys Lys Val Ser Thr Asn Leu
65 70 75 80

Cys Thr His Ser Phe Arg Lys Lys Gln Val Arg
85 90

<210> 15
<211> 29
<212> DNA
<213> Aritifical Sequence

<220>
<223> Synthetic primer

<400> 15
cctactgggtt accaacctga atggaatat 29

<210> 16
<211> 32
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 16
acaggatcca agaacatggtt tattttctta tt 32

<210> 17
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthentic primer

<400> 17
agatctgaat tctatccaat aggaatgtcg cactc 35

<210> 18
<211> 37
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 18
attggatcca ccatgggctg tcttatagga gctgagc 37

<210> 19
 <211> 35
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 19
 atggatccga attctggctg tgcagtaatt gatct 35

 <210> 20
 <211> 30
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 20
 caaggatccg ttatgtactc attcgtttcg 30

 <210> 21
 <211> 35
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 21
 acaagatctg aattctttaa gtcctcaac ggtaa 35

 <210> 22
 <211> 29
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 22
 acaggatcca tcatggcaga caacggtac 29

 <210> 23
 <211> 36
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Synthetic primer

 <400> 23
 aacagatctg aattcgcaat cctgaaagtc ctcata 36

<210> 24
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 24
attggatccg tcatggacaa taaccagaat ggaggacg 38

<210> 25
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 25
aacagatctg aattcattct gcacaagag 29

<210> 26
<211> 35
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic primer

<400> 26
acaccatgga attcgacatg gctatttcac cgaag 35

<210> 27
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> Synthetic pimer

<400> 27
caggtaccgg atccaatatt gcagcagtac gcac 34

<210> 28
<211> 1255
<212> PRT
<213> SARS translated from nucleotides 21492-25259 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 28

Met Phe Ile Phe Leu Leu Phe Leu Thr Leu Thr Ser Gly Ser Asp Leu

1	5	10	15
Asp Arg Cys Thr Thr Phe Asp Asp Val Gln Ala Pro Asn Tyr Thr Gln	20	25	30
His Thr Ser Ser Met Arg Gly Val Tyr Tyr Pro Asp Glu Ile Phe Arg	35	40	45
Ser Asp Thr Leu Tyr Leu Thr Gln Asp Leu Phe Leu Pro Phe Tyr Ser	50	55	60
Asn Val Thr Gly Phe His Thr Ile Asn His Thr Phe Asp Asn Pro Val	65	70	75
Ile Pro Phe Lys Asp Gly Ile Tyr Phe Ala Ala Thr Glu Lys Ser Asn	85	90	95
Val Val Arg Gly Trp Val Phe Gly Ser Thr Met Asn Asn Lys Ser Gln	100	105	110
Ser Val Ile Ile Ile Asn Asn Ser Thr Asn Val Val Ile Arg Ala Cys	115	120	125
Asn Phe Glu Leu Cys Asp Asn Pro Phe Phe Ala Val Ser Lys Pro Met	130	135	140
Gly Thr Gln Thr His Thr Met Ile Phe Asp Asn Ala Phe Asn Cys Thr	145	150	155
Phe Glu Tyr Ile Ser Asp Ala Phe Ser Leu Asp Val Ser Glu Lys Ser	165	170	175
Gly Asn Phe Lys His Leu Arg Glu Phe Val Phe Lys Asn Lys Asp Gly	180	185	190
Phe Leu Tyr Val Tyr Lys Gly Tyr Gln Pro Ile Asp Val Val Arg Asp	195	200	205
Leu Pro Ser Gly Phe Asn Thr Leu Lys Pro Ile Phe Lys Leu Pro Leu	210	215	220
Gly Ile Asn Ile Thr Asn Phe Arg Ala Ile Leu Thr Ala Phe Leu Pro	225	230	235
			240

Ala Gln Asp Thr Trp Gly Thr Ser Ala Ala Ala Tyr Phe Val Gly Tyr
 245 250 255

Leu Lys Pro Thr Thr Phe Met Leu Lys Tyr Asp Glu Asn Gly Thr Ile
 260 265 270

Thr Asp Ala Val Asp Cys Ser Gln Asn Pro Leu Ala Glu Leu Lys Cys
 275 280 285

Ser Val Lys Ser Phe Glu Ile Asp Lys Gly Ile Tyr Gln Thr Ser Asn
 290 295 300

Phe Arg Val Val Pro Ser Arg Asp Val Val Arg Phe Pro Asn Ile Thr
 305 310 315 320

Asn Leu Cys Pro Phe Gly Glu Val Phe Asn Ala Thr Lys Phe Pro Ser
 325 330 335

Val Tyr Ala Trp Glu Arg Lys Arg Ile Ser Asn Cys Val Ala Asp Tyr
 340 345 350

Ser Val Leu Tyr Asn Ser Thr Phe Phe Ser Thr Phe Lys Cys Tyr Gly
 355 360 365

Val Ser Ala Thr Lys Leu Asn Asp Leu Cys Phe Ser Asn Val Tyr Ala
 370 375 380

Asp Ser Phe Val Val Lys Gly Asp Asp Val Arg Gln Ile Ala Pro Gly
 385 390 395 400

Gln Thr Gly Val Ile Ala Asp Tyr Asn Tyr Lys Leu Pro Asp Asp Phe
 405 410 415

Met Gly Cys Val Leu Ala Trp Asn Thr Arg Asn Ile Asp Ala Thr Ser
 420 425 430

Thr Gly Asn Tyr Asn Tyr Lys Tyr Arg Tyr Leu Arg His Gly Lys Leu
 435 440 445

Arg Pro Phe Glu Arg Asp Ile Ser Asn Val Pro Phe Ser Pro Asp Gly
 450 455 460

Lys Pro Cys Thr Pro Pro Ala Leu Asn Cys Tyr Trp Pro Leu Asn Asp
 465 470 475 480

Tyr Gly Phe Tyr Thr Thr Thr Gly Ile Gly Tyr Gln Pro Tyr Arg Val
 485 490 495

Val Val Leu Ser Phe Glu Leu Leu Asn Ala Pro Ala Thr Val Cys Gly
 500 505 510

Pro Lys Leu Ser Thr Asp Leu Ile Lys Asn Gln Cys Val Asn Phe Asn
 515 520 525

Phe Asn Gly Leu Thr Gly Thr Gly Val Leu Thr Pro Ser Ser Lys Arg
 530 535 540

Phe Gln Pro Phe Gln Gln Phe Gly Arg Asp Val Ser Asp Phe Thr Asp
 545 550 555 560

Ser Val Arg Asp Pro Lys Thr Ser Glu Ile Leu Asp Ile Ser Pro Cys
 565 570 575

Ser Phe Gly Gly Val Ser Val Ile Thr Pro Gly Thr Asn Ala Ser Ser
 580 585 590

Glu Val Ala Val Leu Tyr Gln Asp Val Asn Cys Thr Asp Val Ser Thr
 595 600 605

Ala Ile His Ala Asp Gln Leu Thr Pro Ala Trp Arg Ile Tyr Ser Thr
 610 615 620

Gly Asn Asn Val Phe Gln Thr Gln Ala Gly Cys Leu Ile Gly Ala Glu
 625 630 635 640

His Val Asp Thr Ser Tyr Glu Cys Asp Ile Pro Ile Gly Ala Gly Ile
 645 650 655

Cys Ala Ser Tyr His Thr Val Ser Leu Leu Arg Ser Thr Ser Gln Lys
 660 665 670

Ser Ile Val Ala Tyr Thr Met Ser Leu Gly Ala Asp Ser Ser Ile Ala
 675 680 685

Tyr Ser Asn Asn Thr Ile Ala Ile Pro Thr Asn Phe Ser Ile Ser Ile
 690 695 700

Thr Thr Glu Val Met Pro Val Ser Met Ala Lys Thr Ser Val Asp Cys
 705 710 715 720

Asn Met Tyr Ile Cys Gly Asp Ser Thr Glu Cys Ala Asn Leu Leu Leu
725 730 735

Gln Tyr Gly Ser Phe Cys Thr Gln Leu Asn Arg Ala Leu Ser Gly Ile
740 745 750

Ala Ala Glu Gln Asp Arg Asn Thr Arg Glu Val Phe Ala Gln Val Lys
755 760 765

Gln Met Tyr Lys Thr Pro Thr Leu Lys Asp Phe Gly Gly Phe Asn Phe
770 775 780

Ser Gln Ile Leu Pro Asp Pro Leu Lys Pro Thr Lys Arg Ser Phe Ile
785 790 795 800

Glu Asp Leu Leu Phe Asn Lys Val Thr Leu Ala Asp Ala Gly Phe Met
805 810 815

Lys Gln Tyr Gly Glu Cys Leu Gly Asp Ile Asn Ala Arg Asp Leu Ile
820 825 830

Cys Ala Gln Lys Phe Asn Gly Leu Thr Val Leu Pro Pro Leu Leu Thr
835 840 845

Asp Asp Met Ile Ala Ala Tyr Thr Ala Ala Leu Val Ser Gly Thr Ala
850 855 860

Thr Ala Gly Trp Thr Phe Gly Ala Gly Ala Ala Leu Gln Ile Pro Phe
865 870 875 880

Ala Met Gln Met Ala Tyr Arg Phe Asn Gly Ile Gly Val Thr Gln Asn
885 890 895

Val Leu Tyr Glu Asn Gln Lys Gln Ile Ala Asn Gln Phe Asn Lys Ala
900 905 910

Ile Ser Gln Ile Gln Glu Ser Leu Thr Thr Thr Ser Thr Ala Leu Gly
915 920 925

Lys Leu Gln Asp Val Val Asn Gln Asn Ala Gln Ala Leu Asn Thr Leu
930 935 940

Val Lys Gln Leu Ser Ser Asn Phe Gly Ala Ile Ser Ser Val Leu Asn

945		950		955		960
Asp Ile Leu Ser Arg Leu Asp Lys Val Glu Ala Glu Val Gln Ile Asp						
	965		970		975	
Arg Leu Ile Thr Gly Arg Leu Gln Ser Leu Gln Thr Tyr Val Thr Gln						
	980		985		990	
Gln Leu Ile Arg Ala Ala Glu Ile Arg Ala Ser Ala Asn Leu Ala Ala						
	995		1000		1005	
Thr Lys Met Ser Glu Cys Val Leu Gly Gln Ser Lys Arg Val Asp						
	1010		1015		1020	
Phe Cys Gly Lys Gly Tyr His Leu Met Ser Phe Pro Gln Ala Ala						
	1025		1030		1035	
Pro His Gly Val Val Phe Leu His Val Thr Tyr Val Pro Ser Gln						
	1040		1045		1050	
Glu Arg Asn Phe Thr Thr Ala Pro Ala Ile Cys His Glu Gly Lys						
	1055		1060		1065	
Ala Tyr Phe Pro Arg Glu Gly Val Phe Val Phe Asn Gly Thr Ser						
	1070		1075		1080	
Trp Phe Ile Thr Gln Arg Asn Phe Phe Ser Pro Gln Ile Ile Thr						
	1085		1090		1095	
Thr Asp Asn Thr Phe Val Ser Gly Asn Cys Asp Val Val Ile Gly						
	1100		1105		1110	
Ile Ile Asn Asn Thr Val Tyr Asp Pro Leu Gln Pro Glu Leu Asp						
	1115		1120		1125	
Ser Phe Lys Glu Glu Leu Asp Lys Tyr Phe Lys Asn His Thr Ser						
	1130		1135		1140	
Pro Asp Val Asp Leu Gly Asp Ile Ser Gly Ile Asn Ala Ser Val						
	1145		1150		1155	
Val Asn Ile Gln Glu Glu Ile Asp Arg Leu Asn Glu Val Ala Lys						
	1160		1165		1170	

Asn Leu Asn Glu Ser Leu Ile Asp Leu Gln Glu Leu Gly Lys Tyr
 1175 1180 1185

Glu Gln Tyr Ile Lys Trp Pro Trp Tyr Val Trp Leu Gly Phe Ile
 1190 1195 1200

Ala Gly Leu Ile Ala Ile Val Met Val Thr Ile Leu Leu Cys Cys
 1205 1210 1215

Met Thr Ser Cys Cys Ser Cys Leu Lys Gly Ala Cys Ser Cys Gly
 1220 1225 1230

Ser Cys Cys Lys Phe Asp Glu Asp Asp Ser Glu Pro Val Leu Lys
 1235 1240 1245

Gly Val Lys Leu His Tyr Thr
 1250 1255

<210> 29

<211> 274

<212> PRT

<213> SARS translated from nucleotides 25268-26092 of SEQ ID NO:1
 coronaviruses (SARS-CoV)

<400> 29

Met Asp Leu Phe Met Arg Phe Phe Thr Leu Gly Ser Ile Thr Ala Gln
 1 5 10 15

Pro Val Lys Ile Asp Asn Ala Ser Pro Ala Ser Thr Val His Ala Thr
 20 25 30

Ala Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly Trp Leu Val Ile
 35 40 45

Gly Val Ala Phe Leu Ala Val Phe Gln Ser Ala Thr Lys Ile Ile Ala
 50 55 60

Leu Asn Lys Arg Trp Gln Leu Ala Leu Tyr Lys Gly Phe Gln Phe Ile
 65 70 75 80

Cys Asn Leu Leu Leu Leu Phe Val Thr Ile Tyr Ser His Leu Leu Leu
 85 90 95

Val Ala Ala Gly Met Glu Ala Gln Phe Leu Tyr Leu Tyr Ala Leu Ile
 100 105 110

Tyr Phe Leu Gln Cys Ile Asn Ala Cys Arg Ile Ile Met Arg Cys Trp
115 120 125

Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu Tyr Asp Ala Asn
130 135 140

Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr Cys Ile Pro Tyr
145 150 155 160

Asn Ser Val Thr Asp Thr Ile Val Val Thr Ala Gly Asp Gly Ile Ser
165 170 175

Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly Tyr Ser Glu Asp
180 185 190

Trp His Ser Gly Val Lys Asp Tyr Val Val Val His Gly Tyr Phe Thr
195 200 205

Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr Thr Asp Thr Gly
210 215 220

Ile Glu Asn Ala Thr Phe Phe Ile Phe Asn Lys Leu Val Lys Asp Pro
225 230 235 240

Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser Gly Val Ala Asn
245 250 255

Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr Thr Thr Ser Val
260 265 270

Pro Leu

<210> 30
<211> 154
<212> PRT
<213> SARS translated from nucleotides 25689-26153 of SEQ ID NO:1
coronaviruses (SARS-CoV))

<400> 30

Met Met Pro Thr Thr Leu Phe Ala Gly Thr His Ile Thr Met Thr Thr
1 5 10 15

Val Tyr His Ile Thr Val Ser Gln Ile Gln Leu Ser Leu Leu Gln Val
20 25 30

Thr Ala Phe Gln His Gln Asn Ser Lys Lys Thr Thr Lys Leu Val Val
 35 40 45

Ile Leu Arg Ile Gly Thr Gln Val Leu Lys Thr Met Ser Leu Tyr Met
 50 55 60

Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser Leu His Lys Leu Leu
 65 70 75 80

Gln Thr Leu Val Leu Lys Met Leu His Ser Ser Ser Leu Thr Ser Leu
 85 90 95

Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln Ser Thr Ala Leu Gln
 100 105 110

Glu Leu Gln Ile Gln Gln Trp Ile Gln Phe Met Met Ser Arg Arg Arg
 115 120 125

Leu Leu Ala Cys Leu Cys Lys His Lys Lys Val Ser Thr Asn Leu Cys
 130 135 140

Thr His Ser Phe Arg Lys Lys Gln Val Arg
 145 150

<210> 31
 <211> 76
 <212> PRT
 <213> SARS translated from nucleotides 26117-26347 of SEQ ID NO:1
 coronaviruses (SARS-CoV)

<400> 31

Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser
 1 5 10 15

Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala
 20 25 30

Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn
 35 40 45

Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn
 50 55 60

Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val

65

70

75

<210> 32

<211> 218

<212> PRT

<213> SARS translated from nucleotides 26398-27063 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 32

Met	Ala	Asp	Asn	Gly	Thr	Ile	Thr	Val	Glu	Glu	Leu	Lys	Gln	Leu	Leu
1			5						10					15	

Glu	Gln	Trp	Asn	Leu	Val	Ile	Gly	Phe	Leu	Phe	Leu	Ala	Trp	Ile	Met
			20					25					30		

Leu	Leu	Gln	Phe	Ala	Tyr	Ser	Asn	Arg	Asn	Arg	Phe	Leu	Tyr	Ile	Ile
		35					40					45			

Lys	Leu	Val	Phe	Leu	Trp	Leu	Leu	Trp	Pro	Val	Thr	Leu	Ala	Cys	Phe
	50					55					60				

Val	Leu	Ala	Ala	Val	Tyr	Arg	Ile	Asn	Trp	Val	Thr	Gly	Gly	Ile	Ala
65					70					75					80

Ile	Ala	Met	Ala	Cys	Ile	Val	Gly	Leu	Met	Trp	Leu	Ser	Tyr	Phe	Val
			85						90					95	

Ala	Ser	Phe	Arg	Leu	Phe	Ala	Arg	Thr	Arg	Ser	Met	Trp	Ser	Phe	Asn
			100					105					110		

Pro	Glu	Thr	Asn	Ile	Leu	Leu	Asn	Val	Pro	Leu	Arg	Gly	Thr	Ile	Val
		115					120					125			

Thr	Arg	Pro	Leu	Met	Glu	Ser	Glu	Leu	Val	Ile	Gly	Ala	Val	Ile	Ile
	130					135					140				

Arg	Gly	His	Leu	Arg	Met	Ala	Gly	His	Ser	Leu	Gly	Arg	Cys	Asp	Ile
145					150					155					160

Lys	Asp	Leu	Pro	Lys	Glu	Ile	Thr	Val	Ala	Thr	Ser	Arg	Thr	Leu	Ser
				165					170					175	

Tyr	Tyr	Lys	Leu	Gly	Ala	Ser	Gln	Arg	Val	Gly	Thr	Asp	Ser	Gly	Phe
			180					185						190	

Ala Ala Tyr Asn Arg Tyr Arg Ile Gly Asn Tyr Lys Leu Asn Thr Asp
195 200 205

His Ala Gly Ser Asn Asp Asn Ile Ala Leu
210 215

<210> 33
<211> 63
<212> PRT
<213> SARS translated from nucleotides 27074-27265 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 33

Met Phe His Leu Val Asp Phe Gln Val Thr Ile Ala Glu Ile Leu Ile
1 5 10 15

Ile Ile Met Arg Thr Phe Arg Ile Ala Ile Trp Asn Leu Asp Val Ile
20 25 30

Ile Ser Ser Ile Val Arg Gln Leu Phe Lys Pro Leu Thr Lys Lys Asn
35 40 45

Tyr Ser Glu Leu Asp Asp Glu Glu Pro Met Glu Leu Asp Tyr Pro
50 55 60

<210> 34
<211> 44
<212> PRT
<213> SARS translated from nucleotides 27638-27772 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 34

Met Asn Glu Leu Thr Leu Ile Asp Phe Tyr Leu Cys Phe Leu Ala Phe
1 5 10 15

Leu Leu Phe Leu Val Leu Ile Met Leu Ile Ile Phe Trp Phe Ser Leu
20 25 30

Glu Ile Gln Asp Leu Glu Glu Pro Cys Thr Lys Val
35 40

<210> 35
<211> 122
<212> PRT
<213> SARS translated from nucleotides 27779-28147 of SEQ ID NO:1
coronaviruses (SARS-CoV)

<400> 35

Met Lys Leu Leu Ile Val Leu Thr Cys Ile Ser Leu Cys Ser Cys Ile
 1 5 10 15

Arg Thr Val Val Gln Arg Cys Ala Ser Asn Lys Pro His Val Leu Glu
 20 25 30

Asp Pro Cys Pro Thr Gly Tyr Gln Pro Glu Trp Asn Ile Arg Tyr Asn
 35 40 45

Thr Arg Gly Asn Thr Tyr Ser Thr Ala Trp Leu Cys Ala Leu Gly Lys
 50 55 60

Val Leu Pro Phe His Arg Trp His Thr Met Val Gln Thr Cys Thr Pro
 65 70 75 80

Asn Val Thr Ile Asn Cys Gln Asp Pro Ala Gly Gly Ala Leu Ile Ala
 85 90 95

Arg Cys Trp Tyr Leu His Glu Gly His Gln Thr Ala Ala Phe Arg Asp
 100 105 110

Val Phe Val Val Leu Asn Lys Arg Thr Asn
 115 120

<210> 36

<211> 422

<212> PRT

<213> SARS translated from nucleotides 28149-29417 of SEQ ID NO:1
 coronaviruses (SARS-CoV)

<400> 36

Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro Arg Ile
 1 5 10 15

Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn Gly Gly
 20 25 30

Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu Pro Asn
 35 40 45

Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu
 50 55 60

Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly
 65 70 75 80

Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg
85 90 95

Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr
100 105 110

Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala Asn Lys
115 120 125

Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr Pro Lys
130 135 140

Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr Val Leu
145 150 155 160

Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala Glu Gly
165 170 175

Ser Arg Gly Gly Ser Gln Ala Ser Ser Arg Ser Ser Ser Arg Ser Arg
180 185 190

Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn Ser Pro
195 200 205

Ala Arg Met Ala Ser Gly Gly Gly Glu Thr Ala Leu Ala Leu Leu Leu
210 215 220

Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys Gly Gln
225 230 235 240

Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu Ala Ser
245 250 255

Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn Val Thr
260 265 270

Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn Phe Gly
275 280 285

Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp Pro Gln
290 295 300

Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met Ser Arg

Lys Leu Ala Thr Thr Glu Glu Leu Pro Asp Glu Phe Val Val Val Thr
85 90 95

Ala Lys